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A Review of 1946

Perhaps the most satisfying feature of last year was the confirmation of the fact that German foundries were, generally speaking, not in advance of their British counterparts. In many directions they were not so modern or so well equipped, but they had gone a little ahead in the development of core-blowing. In the non-ferrous section, some interesting developments were noted in the centrifugal casting field, but these were an outcome of an endeavour to minimise the consumption of metals expected to be in short supply under war conditions. In general, the myth of German superiority in scientific fields has been exposed. It was well known by the *cognoscenti*, that in pure and applied chemistry Germany excelled, but not so either in physics or metallurgy.

We are not at all satisfied with the progress that is being made with the new precision casting process, involving the use of ethyl silicate, as an investment. A good many people have tried it out, some have met with success and some with failure. We suggest that a private conference should be held in which experiences could be pooled. A general stock-taking of the position would be productive of much good, as we are convinced from an examination of American literature, that properly handled, the process shows real potentialities.

Another factor of importance was the disclosure by the British Cast Iron Research Association of a new type of nodular cast iron, and extended reference has been made to this quite recently in our columns. We hear of good progress being made with the continuous process for the production of grey-iron castings using chill moulds. Known as the Eaton-Erb process, this quantity production method of making castings should do well, as we believe that British irons are specially suited to its metallurgical and economic development.

Despite the fact that there is a crucial shortage of man-power in the industry, it is a matter for congratulation that the year's recruitment has been of the order of 25,000 for the ironfounding section. With the promised Governmental-sponsored recruiting campaign, plus the influx of Italians, this year should show a distinct amelioration—*if* raw material supplies can be increased. The production of castings is running at quite a substantial level. Final statistics should show the output of iron castings to be greater than 2½ million tons; copper-base castings should be of the order of 82,000 tons, and light alloy castings about 33,000 tons. At the moment the production of steel castings is averaging 180,000 tons per annum. Never before, at least in our lifetime, has the foundry industry been so prominently featured in the national Press. Much misinformed opinion has been aired, especially as to the shortage of castings holding up the building programme. However, since the publication of Mr. Blair's letter giving the facts of the case, these attacks have ceased. There have been but few new foundries put into commission, owing to the difficulty of receiving approbation from all the Ministries concerned. There is but little hope of improvement in the foreseeable future. However, extensions and mechanisations have gone on steadily. The year just past showed the extreme resilience of the industry, which despite shortages, and the stranglehold of controls, has managed to achieve, and in many cases exceed, pre-war production. Given the chance, the industry will this year benefit from its efforts at mechanisation, continue to extend employees' amenities, and consolidate its hard-won position as a recognised basic industry of supreme importance to every major human activity.

Contents

A Review of 1946, 27.—Forthcoming Events, 28.—A Curious Accident, 28.—The Old Stagers, 28.—Coke Quality Research, 28.—Education in the Foundry, 29.—We Acknowledge, 35.—Fowler-Marshall Merger, 36.—Australian Overseas Trade, 36.—Book Review, 36.—House Organ, 36.—Scottish Light Castings Industry, 37.—Welsh Industries Fair, 38.—A Novel Mechanical Pouring Unit, 39.—Colour in the Foundry, 40.—National Foundry College, 40.—New Year Honours, 41.—Personal, 42.—Steel Control Order Amendments, 43.—Non-ferrous Scrap Metal Prices, 43.—Price of Tungsten Ore, 43.

FORTHCOMING EVENTS

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

JANUARY 10.

Keighley Association of Engineers:—"Textile Machinery." At Devonshire Buildings, Devonshire Street, Keighley, at 7.30 p.m.

JANUARY 11.

Keighley Association of Engineers:—Visit to John Lund, Limited, at 2.30 p.m.

JANUARY 15.

Institute of Welding (North London branch):—"The Application of Welding to Steel Structures," by R. G. Braithwaite. At the Fyvie Hall, Polytechnic, Regent Street, London, W.1, at 7.30 p.m.

Royal Statistical Society—Industrial Applications section (Birmingham and District group):—"Statistical Definitions and Their Consequences," by V. E. Gough. At the Chamber of Commerce, 95, New Street, Birmingham, 2, at 6.30 p.m.

JANUARY 16.

Sheffield Society of Engineers and Metallurgists:—Annual general meeting. "Some Recent Problems for Railway Metallurgists." by Dr. Hugh O'Neill. At the Royal Victoria Station Hotel, Sheffield, at 6.15 p.m.

JANUARY 17.

Chemical Engineering Group:—"Flame Spraying of Metals and Plastics by the Powder Process," by F. A. Rivett. At the Geological Society, Burlington House, Piccadilly, London, W.1, at 5.30 p.m.

Institute of Physics (Industrial Radiology group):—"Sonic Methods in Non-destructive Testing," by R. Meakin. At E.L.M.A., 2, Savoy Hill, London, W.C.2, at 6.30 p.m.

Institute of British Foundrymen

JANUARY 11.

Birmingham branch:—Annual dinner and dance. At the Botanical Gardens, Edgbaston, Birmingham.

West Riding of Yorkshire branch:—"Problems of the Jobbing Foundry," by A. E. McRae-Smith. At the Technical College, Bradford, at 6.30 p.m.

JANUARY 14.

Burnley section:—"A Magnesium Foundry," by B. Malone. At the Municipal College, Ormerod Road, Burnley, at 7.30 p.m.

JANUARY 16.

Lincoln section:—"Some Notes on American Ironfoundry Melting Practice," by W. J. Driscoll. At the Technical College, Lincoln, at 7.15 p.m.

JANUARY 18.

Bristol and West of England branch:—"Bronze Castings," by J. L. Howard. At the Grand Hotel, Broad Street, Bristol, at 3.30 p.m.

A CURIOUS ACCIDENT

On advertisement page no. 40 of our issue of December 19, 1946, the photograph of an oil-fired rotary furnace, manufactured by Stein & Atkinson, Limited, of 47, Wolsey Road, East Molesey, Surrey, was, due to the fracture of the printing block, shown with one of the support structures and roller brackets completely missing. We sincerely regret this extraordinary accident.

PRODUCTION OF steel ingots and steel for castings in the United States reached 84 per cent. of capacity in November, compared with 89 per cent. in October and 79 per cent. in November, 1945.

COKE QUALITY RESEARCH

The cupola research committee of the American Foundrymen's Association, in an effort to establish a prior-to-use method of evaluating cupola coke quality, will sponsor an intensive study of foundry coke quality and behaviour. As a first step, the project will seek a basis of correlating coke properties with actual operating experience by analysis of data to be acquired under actual melting conditions in a number of co-operating foundries. These data, covering such factors as fuel ratios, air volume, analysis of effluent gases, melting rates and metal temperature, slag, type of metal produced, cupola construction and the like, will be collected, integrated and analysed by a research worker to be employed by the committee. Field studies are to be supplemented by laboratory investigations where indicated.

Coke used as the operating data are gathered will be subjected to the usual chemical analyses and to shatter, density, rumble, cell structure, and other physical tests. To obtain controlled coke of known heredity and careful sizing for the field tests, the committee is seeking the co-operation of producers. As nearly as practical, data developed by the project will be issued as quarterly reports and, after committee review, will be the basis for further studies.

THE OLD STAGERS

Since we published recently a list of "old stagers" of the Institute of British Foundrymen, several readers have written pointing out omissions. In order to forestall any further correspondence on the subject, and also in view of the obvious interest being shown, we have made a further study of the I.B.F. register of members. The result of this research has resulted in the following revised list:—

1904—Mr. F. J. Cook and Mr. R. L. Rankin.

1905—Mr. K. M. Burder, Mr. J. T. Goodwin, Mr. W. H. Meadowcroft and Mr. W. B. Parker.

1906—Mr. A. Bowman, Mr. M. H. Curnow, and Mr. S. H. Russell.

1907—Mr. F. Andrew, Mr. D. A. Aston, Mr. A. H. Cook, Mr. C. Fontaine, Mr. F. H. Hurren, Mr. A. L. Key, Mr. D. Landale, Mr. J. Parkinson, Mr. R. J. Shaw and Mr. H. Sherburn.

1908—Mr. V. C. Faulkner and Mr. R. D. Welford.

1909—Mr. T. G. Hilton, Mr. V. Jobson, Mr. J. S. Moorhead and Mr. J. Pell.

1910—Mr. H. Bunting, Mr. F. J. Cree, Mr. J. Hay, Mr. M. S. Kenyon, Mr. G. MacKay, Mr. H. McPhie, Mr. W. Oxley, Mr. W. R. Rawlinson, Mr. A. Sutcliffe and Prof. T. Turner.

VAUXHALL MOTORS, LIMITED, of Luton, Beds, have installed in a new foundry the Kirksite process for making dies. Of American origin, this zinc alloy is stated to have a tensile strength of 17 tons per sq. in.; a Brinell hardness of 100 (which can be increased to 130 by heat-treatment), and a melting point of 380 deg. C. Associated with this is a shrinkage of only 0.14 to the foot.

EDUCATION IN THE FOUNDRY*

Some problems of education and training in the foundry and their solution

By JOHN B. LONGMUIR, M.B.E.

A Paper by the Author on this subject was published in the FOUNDRY TRADE JOURNAL of May 16, 1946, but there was only space available to consider one week's timetable of the first four weeks' course. The timetables of the second week of the second four weeks' course, and the first week of the third four weeks' course are shown in Figs. 1 and 2, wherein it is shown that the same plan is followed. The day starts with a personal inspection, a different subject each day. The day is broken up to give variety and to secure the maximum amount of attention. Progress must be gradual, and new subjects should not be attempted till there has been revision of the previous four weeks' course. It will be seen that the foundry apprentices always have the last hour in the gymnasium, after which they have a shower.

The connection between the talks and the practical work will be noted, for example, in the second week of the second course, there is on Tuesday morning a talk on "Cover Cores," two hours later "Cover Cores" are used in the workshop. On Thursday a "Core Sands" talk is followed with practice in core-making and drying. On Friday there is "Weight Estimation," with checking weights of castings. The same connection will be noted in the third course. The period on "Self Expression" gives the instructor scope to use his imagination and ingenuity. Some physical work is included in every course. The practice of using guest speakers is continued. Incidentally this is a practical way of integrating training with the day-to-day management of the company.

General Subjects

The subjects under the heading "Foundry Calculations" and "General Topics" are taken by the education officer. He is endeavouring, by using the "job motif" to get the boys interested in continuing their general education. For example, all calculations are taken from the foundry. Unfortunately, decimals and fractions have to be taught before any progress can be made. Under "General Topics" the following devices have been used as a starting point, for talks, discussions, and to get the boys observing and thinking—the "Common Ground Series" of film strips on industry, mining, iron trades, railways, chemicals and public services, being typical. Films of special interest—"The Bailey Bridge," "Vitrolite," "How Steel is Made," "Transfer of Power"—are also used. A brains trust on "Eighteen Months in the Forces for All" brought out a clash of views.

Sketching.—This is a most important means of expression for all engineers, and it can be used to aid verbal expression.

Reading Drawings.—If foundry personnel are to maintain their self respect, they must be in a position to read drawings and blue prints with the same facility as other engineering personnel. Machine drawing, or reading blue prints, will be one of the separate subjects in the fourth and subsequent four weeks' courses.

Laboratory.—The same methods are used in the laboratory to get the boys interested in science in the foundry, and to impress them with the importance of their calling and the need for further study. Various experiments related to foundry work are carried out to show the expansion and contraction of metal, *e.g.*, heating lengths of small bore tubing in various metals to compare relative expansion. The ring and ball experiment is also used.

These are experiments to show the behaviour of steam and its effect on moulds, the expansion of air when heated, showing the necessity for venting; pressure exerted by liquids in a U tube, showing the necessity for weighting and clamping boxes. Sand is examined under the microscope to show grain size; shape and distribution. The percentage of clay, moisture, and coal dust in moulding sands presents scope for practical experiments.

Mr. T. Parkinson, the instructor responsible for doing the job, then explained his methods in detail, using slides prepared from pictorial charts now being prepared in conjunction with educational publicity.

Daily Routine Tests of sand for moisture, permeability and green crushing strength are carried out, and the results are recorded in chalk on large wall graphs. It has been found that the boys prefer this form of plotting to graph paper, which is possibly too reminiscent of school. New experiments are constantly being tried to keep the boys interested. The same methods are practised in the training centre workshop. Sample bars of various metals are cast to compare contraction, surface finish, fluidity and shrinkage.

Evening Classes

It is expected, as this scheme develops, that all foundry apprentices will attend, of their own accord, evening classes arranged by the local education authority or at local technical colleges. The best boys already take the ordinary national certificate classes, but for the great majority City and Guilds courses in foundry work will be more suitable. Everything possible should be done to keep foundry apprentices on the educational ladder as long as possible by offering cash bonuses and other inducements.

Companies, which have or are contemplating the introduction of mechanisation in their foundries, may

*A Paper presented to the Birmingham, Coventry and West Midlands branch of the Institute of British Foundrymen. The Author is General Welfare Officer, Newton, Chambers & Company, Limited, Sheffield.

Foundry Education and Training

FIG. 1.—SECOND MONTHS' COURSE—TIME TABLE FOR SECOND WEEK.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
7.30 a.m.	*Inspection and Notices.*					
7.45 a.m.	The Production of Pig-iron in the Blast Furnace.	Foundry Methods —"Cover Cores"	The Foundry Cupola.	Core Sands and Vents.	Weight Estimation.	Mould Ventilation.
9 a.m.	*Morning Break.—Cocoa and Rolls.*					
9.15 a.m.	Self Expression.	Self Expression.	Missing Links.	Self Expression.	Self Expression.	Spelling Bee.
9.45 a.m.	Moulding Practice.	Using Cover Cores in the Workshop.	Moulding in Aluminium.	Core-making and Drying.	Moulding in Iron. (Checking Weight of Castings).	Cleaning. Assembly.—General Games.
9.45 a.m.	Foundry Calculations.		Foundry Calculations.		Foundry Calculations.	
12 noon	*Lunch Hour.*					
1 p.m.	Notes and Sketching.	Notes.	Visit L.C.D. and H.C.D. Cupolas.	Notes.	Physical Work.	
2 p.m.		Workshop.		Visit Core Benches and Stoves.		
2.45 p.m.	Speaker.	Speaker.	Films.	Speaker.		
3.30 p.m.	*Hour in Gymnasium for Physical Education.*					
4.30 to 5 p.m.	*Reading-Dismiss.*					

consider that this will eliminate the need for training. Are they justified in this? Few foundries will ever be completely mechanised, and the most intricate jobs will still be cast on the floor, and at all events the planning and the day-to-day operation of such plants will require to be the responsibility of trained personnel. Moreover, it is claimed that a man who understands the whole moulding process will be a better member of a team of operatives of a mechanised plant. All boys who start foundry training will not become first-class craftsmen; and some of them will prefer machine moulding, or even work on a mechanised plant. It must be emphasised that one of the great benefits of a training scheme is the improved morale of all who pass through it.

Apprentices' Special Bay

Within the last four months there has been an important innovation in this training plan which will be of special interest to small foundries. The boys now proceed, after the four weeks' course, to a special "apprentices' bay," where they work on ordinary production jobs under the supervision of one of the best moulders, called an apprentice instructor. He instructs, by actual demonstration, approximately 10 apprentices. It is the intention to keep the apprentices in this bay for at least two periods of five months. This is an experiment, and it may have to be changed in the light of experience. So far, it is working well, but vigilance will be required to ensure that progressive jobs are obtained and repetitive jobs avoided. The claims of training must come first.

In this bay, attempts are being made to inculcate tidiness by providing, as in the workshop of the foundry training centre, racks for tools, shovels, rammers, small patterns, etc. For common equipment, bellows, parting powder, etc., required by the apprentices from time to time during the course of their job, there is a specially constructed rack placed in the middle of the bay. There is proper locker accommodation for clothes and personal belongings. A clean up at the end of the day is a ritual which is being enforced. As much colour as is practical is used in this bay on the same lines as in the foundry training centre workshop, lecture room and laboratory.

FIG. 2.—THIRD MONTHS' COURSE—TIME TABLE FOR FIRST WEEK.

Time.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
7.30 a.m.	*Inspection, Notices and Team Marks.*					
7.45 a.m.	Introductory Talk. Team Selection.	"Foundry Sands and Clays."	"Foundry Mechanisation."	"Slag Control."	"Measurement in the Foundry."	Revision of Week's Work.
9 a.m.	*Morning Break.—Cocoa and Rolls.*					
9.15 a.m.	Mental Agility.	Kims Game.	Splitting Words.	"Test Bowler."	Size Estimation.	Quick Questions.
9.30 a.m.	Sand Mixing and Tempering.	Two Part Moulding.	Operating Moulding Machine.	Practice Forming Runner Basins, Filters and Ingates.	Making Moulds and Cores which Require Measuring and Setting	Hot Air and Steam Experiments in the Laboratory.
11 a.m.	Foundry Calculations.		Foundry Calculations.		Education Officer —General Topics	
12 noon	*Lunch Hour.*					*Dismiss.*
1 p.m.	Isometric Sketching.	Notes.	Notes.	Sketching.	Notes.	
2 p.m.	Open Sand Moulding.	Two Part Moulding.	Machine Moulding.	Continue mornings' work and cast.	Assembling Moulds and Casting.	
2.45 p.m.	Sand Testing.	Speaker.	Films.	Discussion on Day's Work.	Examining Results.	
3.30 p.m.	*Hour in Gymnasium for Physical Education.*					
4.30 to 5 p.m.	*Reading: Discussion: Dismiss.*					

Other good habits are being established in the bay. Daily routine tests of moulding sand are carried out and recorded on a special graph as used in the laboratory. Quality and safety comes before quantity. Variety of work is the constant aim of the instructor. The percentage of "wasters" is recorded. The economic value of foundry floor space is kept constantly before the apprentices, and they are encouraged to take an interest in the planning and layout of their bay.

The length of service in this bay has not been fixed; it will depend on individual progress. Other considerations may be the rate of intake and the requirements of other sections of the foundry. The aim is that by the time the boys move out of this bay they will either be able to work in a sand heap by themselves or be accepted by a moulder as a fully fledged mate.

Other improvements to this bay are contemplated, but its success is not in doubt. The keenness of the boys to be the first to get the ladle of metal and to see the finished casting has to be seen to be believed. A run out or a waster brings so much derision from the other boys that mistakes are not repeated. The range of work which can be attempted in this bay is still under consideration at meetings of the foundry apprentice training advisory committee.

Co-operation of the Men

One of the pitfalls in setting up a training department is that it becomes a water-tight compartment, and has no connection with either the foundry management or the moulders, yet the closer the co-operation the better. One practical way is to use a representative of the management and of the moulders to act as assessors at the oral examination held at the end of each four weeks' course. Their experience and interest can also be enlisted by inviting them to serve on an up-grading or training advisory committee. Both sides have a direct contribution to make, and their interest in the apprentices once aroused is easily maintained throughout all stages of apprenticeship.

It must be admitted that there has been exploitation of the boy by the journeyman. He is inclined to use the boy to fetch and carry and to use him as a labourer. Not all journeymen are either capable or willing to teach the apprentice, and some resent the loss of earnings a new boy involves. Their sympathy and interest in the apprentices can be aroused and stimulated to the great advantage of all concerned. Men will not continue for long a practice in opposition to the joint recommendation of their own representatives and the management, who serve on training advisory committees.

Foundry Education and Training

Trade Tests

Another useful service for such a committee, which has still to be developed, is the setting up of standards of skill required in each year of apprenticeship by the establishment of trade tests. This would be a stimulant to the apprentices, as well as a measure of the success of the training. Up till now tests have been confined to a job test in each of the one month courses. These have shown the great value of trade tests, which must be developed and widely recognised.

At each meeting of the training advisory committee the record of every apprentice should be scrutinised, the men's representatives can frequently supplement the instructors' and the foremen's report. It is not possible to know too much about apprentices, if the maximum use of their individual capacities is to be made. The boys must not be allowed to become the subjects of domestic disputes between management and the men's representatives.

Training by Imitation

The ordinary man's actions are dictated by the herd, says the psychologist, and he is in consequence a great imitator. The boy imitates the man. Training by imitation, therefore, has to be acknowledged and recognised. It may be a power for both good and evil; but unfortunately bad practices seem to be the most easily imitated, and unless energetic steps are taken to ensure that only the best and most efficient practices and methods are manifest in a workshop, there will be perpetuation of inefficient and unsafe ways of doing jobs, and is a sound argument for all firms, great and small alike, taking the initiative in training by proper methods and not leaving it to chance.

For the same reason, training by example is better than training by precept. It is, in this phase of training, that the manager exerts his greatest influence for good or evil. The manager or foreman is the natural leader of the herd, and he can, by the force of example, dictate the morality of his group. A tremendous responsibility therefore rests on the manager or foreman who is in executive control. He can exert greater moral influence than any reformer. Where vulgar ostentation, favouritism, unfair or underhand actions are in evidence, loss of respect and influence quickly follows. Whereas conduct, which is inspired by a deeply rooted desire for fair play and a square deal, will slowly but surely win the respect and esteem, which will enable him to be a real leader and an influence for all that is upright and good with his men.

Training for Supervisors

There will be general agreement, therefore, that the systematic training of supervisors, which includes everyone who supervises one or more persons, is of tremendous importance. The following methods have been attempted, with varying degrees of success.

(1) Series of lectures by experts arranged by the individual managements.

(2) Formation of foremen's associations for mutual aid and discussions.

(3) Exchange of from a day to a week's duration, with foremen doing similar work with other firms.

(4) Regular meetings of foremen with senior members of the management to discuss matters affecting their day-to-day relations with their workpeople, and to receive guidance from the senior executives.

(5) Informal "discussion groups" under the leadership of a manager, senior foreman, or member of the personnel department.

(6) Courses for supervisors, which have been organised during the war by the Ministry of Labour, and other Government departments.

These methods may be used individually or they may be used in combination of all or some of them, depending on the size of the firm. From practical experience all of them are worth while, and can be recommended.

Training within Industry

The most exciting and interesting experiment in training supervisors is "T.W.I.," now being sponsored by the Ministry of Labour. This method of training had a phenomenal success in America, where millions of workers had to be trained, in a hurry, to meet war production needs. Our Government sent an observer to America to study it, and he brilliantly adapted it for use in this country. This method deserves the serious consideration of every responsible person in industry. There are three programmes:—(1) Job instruction; (2) job relations, and (3) job methods.

Each programme consists of five two-hour sessions on consecutive days of the week. The leaders of discussion or trainers may be provided by the Ministry of Labour for small firms, or the Ministry of Labour will train the firm's own trainers, if the number of supervisors to be trained exceeds 60. If firms have not already started this training they should do so as soon as possible. The Ministry of Labour are setting up an organisation in each of their regions to deal with this training, and managements should get into touch with their regional office without delay. The procedure is for an official to give an "appreciation" lecture on each of the above programmes to the top management of a firm if it is big enough, and, if not, to groups of executives from a number of firms. This is usually followed by an "Institute" where 10 prospective trainers from various firms are given a full week's training. The successful trainers are given a "manual," or book, and the firm is expected, without delay, to arrange groups of 10 supervisors to undergo the five two-hour sessions.

Times for Sessions

The choice of trainers is of great importance, and where the number of supervisors justifies it they should be relieved of all other duties to concentrate on the work. The best time for the sessions is between 10 a.m. and 12 noon, a session in the afternoon from

2.30 to 4.30 is next best, and an evening session should be avoided if possible. It usually results in absenteeism. There is a great temptation to hold these meetings after working hours, as it interferes with production to take so many supervisors off during productive time. Holding them during working hours has the great advantage of ensuring that the supervisors are fresh, and convinces them that the firm takes the training seriously and is prepared to make sacrifices for it.

All levels of management, from the managing director downwards, should undergo the training. Opinions are divided as to the inclusion of different grades of management in the same group, but from experience, discussions are freer with supervisors on the same level of management. The more varied the type of work represented in the group, the better; for example, supervisors from a colliery should come from the surface, underground, maintenance, workshops and offices. Clerical supervisors should be included with supervisors from the productive workshops and maintenance department. Incidentally one of the unexpected advantages secured from these group discussions has been improved internal relationship from supervisors from different sections of the Author's organisation getting to know one another's difficulties and problems.

The Ministry of Labour supply the literature for the groups, and experts ensure by visits during the session that the procedure laid down in the manual is closely followed, and the standard is maintained. If it is made clear that the members are free to express their views and if the trainer does his part, every member of the group will open out and the deliberations will be both lively and instructive. A senior member of the management should open and close each course, and the opportunity should be taken to get every supervisor to express his views on the practical application of the method in his day-to-day work.

It should be made clear that the trainer does not submit a report about each member of the group, and that anything that is said round the table will not be repeated outside. A comfortable room should be placed at the disposal of the group, and they must not be interrupted. The more closely the job and problems used in the deliberations relate to the day-to-day experience of the group the better, and every encouragement and help should be given to them to bring equipment and plant into the room, if it is going to make the job demonstration more realistic and real.

Job Instruction

Job instruction is easier to comprehend, and is the most suitable for a start. It is not proposed to deal in detail with the methods of instruction, as this would be cutting across the Ministry of Labour's "Appreciation Session." The important considerations are the actual application and the "follow up," and these have not had the attention they deserve. The management must make it clear that the "Four Steps" in instructing should always be taken and "Break-down" sheets used.

Every supervisor should be encouraged to keep a training timetable for his department. The management should "follow up" by investigating if "job instruction" procedure was properly carried out in every case of spoiled or scrapped work.

Job Relations

The same should apply in the case of the "job relations" programme. The four steps which are the foundation of "good relations" must always be taken by the supervisors when a human problem arises. The management must encourage every supervisor to make full use of the "job relations" training by practising every known way of maintaining interest in good relations.

Approximately 600 members of all levels of management of Newton, Chambers & Company, representing mining, engineering, chemicals, office management and all administration grades, have received these two training courses, and all have acknowledged that it has been of value to them, and most of them expressed regret that they had to wait so long for this kind of training.

Job Methods

Thirty supervisors in this organisation are now receiving, each week, training in this programme of "job methods." It is proving as successful as the other two programmes, and some of the managers are of the opinion that it is more beneficial than the other two programmes. It is a plan to help all supervisors to make the best use of available man-power, machines and materials; as in the other programmes there are four steps:—(1) Break down the job; (2) question every detail; (3) develop the new method, and (4) apply the new method. It consists of five two-hour sessions, and each member of the group brings a job for submission to the plan.

As a preparation for starting an "employee suggestion scheme" or for securing the willing acceptance of new ideas, this "job methods" programme is ideal, and is thoroughly recommended.

Higher Management Training

Nearly everyone who has studied the question of specific training for higher management agrees that there are two main difficulties. The first is that it is too late to wait till the appointment is made before training starts, and, in any case, how are trainees to be selected if training is to precede appointment? Prospective trainees will hesitate to volunteer because of fear of ridicule from colleagues. If chosen for training by the management before appointment, there is a moral obligation to appoint when a vacancy occurs. The second is that nearly all candidates for promotion have to concentrate on the narrow technical training associated with their industry and trade, and they have not had the time for the general broadening and cultural study associated with humanities.

Everyone who has to deal with the human factor

Foundry Education and Training

must develop human understanding. There are many ways of doing so, but the most direct is by submitting to the discipline of the systematic and regular study of humanistic subjects, such as one of the courses conducted by the industrial administration departments of universities or colleges of technology. Nearly all enlightened universities of this country have social science or industrial administration departments.

Subjects Studied

The subjects studied are economics, industrial psychology, general psychology, industrial relations, personnel management, social economics, social administration, industrial management, industrial law and social methods. The name "School of Social Study and Training" under which many of them operated in the past may have discouraged many from attendances, but as the courses recognised by the Institute of Industrial Administration are very similar, there is a splendid opportunity for these social science courses to widen their scope and influence by a change of name. The content of these courses is just what the executive, who by the time he is twenty-three will have completed his technical studies, requires.

Birmingham is fortunate in having available this type of educational institution, and managing directors should see to it that every promising young man on their staff is encouraged to volunteer by the offer of facilities to obtain such splendid background training. In the Author's opinion every manager and foreman who wishes to develop the many and varied qualities now required by the modern persuasive type of industrial leadership must attend one of the courses available.

The growing complexities of industrial relations and the intensive development of industrial legislation, which the present Parliament is not likely to arrest, imposes on the industrial executive the great need for systematic and consecutive training to develop the necessary skill in leadership. Industrial management is now a highly skilled vocation. It can become a highly honoured one only if it is inspired with sympathy and practised with human understanding and skill.

Two Criticisms

The criticisms mostly encountered are the excessive cost, and that only the large firms can undertake the training just described.

The Cost.—It is always a disadvantage to have to pay for anything, and when a training department is set up and all training concentrated, it is easy to fix the cost and it may look excessive. There has always been training even if it has been haphazard and inefficient. It cost money, but the actual amount has been hidden, and it is safe to say that it was extravagant. When the Author was serving his apprenticeship, a skilled turner had to leave his lathe standing idle to come to the rescue of the apprentices and assist them to set up their machines or to endeavour to rectify faulty work. If the cost of such haphazard methods of training could be accurately assessed, proper training schemes would be found to be an economy and would be more widely set up.

The Small Firm Can Train Too.—It must be admitted that 77 per cent. of the companies registered in the country employ fewer than 25 persons, and only 0.4 per cent. (519 firms) employ more than a thousand. This question of training is therefore very much a small-firm problem. It is claimed that no matter how small the firm is it cannot neglect the function of training and it is emphasised that apart from the setting up of the vocational craft training centres described, all other types can be and must be carried out by the small firm. These are listed as follows:—

(1) *Pre-entry Training.*—Even if only two youths are engaged per annum, it is worth securing their interest and goodwill by explaining to them something of the history, the policy, and organisation of the business.

(2) *Craft Instructor.*—By the appointment of an instructor, part time or full time, to train the youths by actual demonstration of the job given to the youths by the foreman, as described earlier in this Paper.

(3) *Youth Leader or Apprentice Master.*—By the appointment of a youth leader or adviser, part time or full time, to advise all youths on their careers, to explain the educational ladder to them, to bring existing educational facilities to their attention, and generally to act as guide, philosopher and friend to them.

(4) *T.W.I. and Lecture Courses.*—Take steps to see that supervisors are given T.W.I. training and encouraged to take advantage of existing lecture courses for foremen and supervisors.

(5) *Background Training.*—The small employer or his deputy would benefit from attendance at the courses arranged for higher management described earlier in this Paper.

(6) *Combination of Small Firms.*—The possibility of several small firms in the same industry combining to set up a group scheme for their youths as arranged for the building and printing industries.

(7) *Booklet or Leaflet.*—It would pay every company to prepare a booklet, leaflet, or even a letter, describing conditions of work and inviting them to seek the help and advice of certain members of the firm.

Education Act, 1944

Most firms are naturally anxious about the implications of the Education Act, 1944, especially with provisions of part-time day release for attendance at county colleges. This section will not be operative till 1950; but companies or groups of companies should not wait till then. There is so little experience on which to base the curriculum of the proposed county colleges that it is desirable that as many experiments as possible should be carried out within the next five years.

Works schools may gain recognition as county colleges, if the vocational content of the syllabus is not more than $\frac{4}{5}$ths of the complete syllabus of 330 hours per annum.

The advantages to be secured from recognition are so important that it will pay firms to start now. These are:—

(1) Time saved in travel and a choice in the spread of the 330 hours, *e.g.*, from personal experience two periods of four weeks a year are better than one day per week.

(2) More reliable and valuable information about the capabilities and character of each youth is obtained.

(3) The goodwill of each youth is secured.

(4) Industry must be in a position to talk authoritatively and with experience on the education of young wage earners.

(5) There is a great dearth of informed lay-educationists in the country and education requires the help and the advice of practical people from industry and commerce.

SUMMARY

(1) If the right kind of boy is to be attracted to the industry there must be improvement in conditions by the provision of washing and changing facilities, improved heating and lighting, orderliness and tidiness in the foundry. The best recruiting agents for the foundry are the boys already in the foundry.

(2) The recruitment of apprentices should be the responsibility of senior members of the staff, and there should be more care in the selection of youths and individual attention throughout apprenticeship.

(3) Systematic training schemes should be set up and encouragement to continue technical studies.

(4) There must be equal opportunity for promotion and advancement.

(5) The industry should set up a recruitment and training committee which will take steps to have slides, strip films, models, pictorial charts, and other visual aids drawn up for the industry and encourage all foundries to develop their own training.

(6) There should be specific training in man management for foremen and all grades of management.

(7) Finally, there must be a sincere belief on the part of all foremen, managers, and general managers, connected with a foundry of its supreme importance in the national effort.

WE ACKNOWLEDGE . . .

We acknowledge with grateful thanks the receipt of the calendars, diaries and greetings listed below. In so doing we wish to reciprocate most heartily the messages of good will expressed.

Calendars

S.A. P. H. BONVILLAIN & E. RONCERAY, rue Paul-Carle à Choisy-le-Roi (Seine), France.—A monthly tear-off wall calendar, each sheet being illustrated with an item of foundry equipment.

JAMES DURRANS & SONS, LIMITED, Phœnix Works, Penistone, near Sheffield.—A monthly tear-off wall calendar, surmounted by an interior view of Exeter Cathedral.

EYRE SMELTING COMPANY, LIMITED, Tandem Works, Merton Abbey, London, S.W.19.—A large monthly tear-off wall calendar.

HARBOROUGH CONSTRUCTION COMPANY, LIMITED, Market Harborough, Leics.—A monthly tear-off desk calendar in black and white, with a reproduction of an original drawing of the High Street, Market Harborough.

HARGRAVES BROS., Quay Street, Manchester, 3.—A large monthly tear-off wall calendar.

H. HENDRA & SON, Beddington Lane, Croydon, Surrey.—A monthly tear-off wall calendar depending from a reproduction of "Lady Betty."

HOLMAN BROS., LIMITED, Camborne, Cornwall.—A monthly tear-off wall calendar, surmounted by a reproduction of "The Fish Market, St. Ives, Cornwall, 1896."

STEEL CITY SUPPLY COMPANY, LIMITED, Flameox Works, Bailey Lane, Sheffield, 1.—A large monthly tear-off wall calendar.

STEWART & GRAY, LIMITED, Paisley Works, Tooting, London, S.W.17.—A monthly tear-off wall calendar depending from a reproduction of "Seeing's Believing."

STEWARTS AND LLOYDS, LIMITED, of London, Glasgow, Birmingham and elsewhere.—A monthly desk calendar, the frame being white, edged with gold, and decorated with the Union Jack.

Diaries

FRODAIR IRON & STEEL COMPANY, LIMITED, Fenchurch House, London, E.C.3.—A four days to the page vest pocket diary, with pencil attached.

HADFIELDS, LIMITED, of Sheffield.—A six days to the page desk diary with an illustration, having some connection with the company, on every other page.

THE MOND NICKEL COMPANY, LIMITED, Grosvenor House, Park Lane, London, W.1.—A three days to the page vest pocket diary, prefaced by useful technical data.

STEWART & GRAY, LIMITED, Paisley Works, Tooting, London, S.W.17.—A seven days to the page diary, prefaced with various vitreous enamelling data.

UNITED STEEL COMPANIES, LIMITED, of Sheffield.—A seven days to the leaf desk diary.

Greetings

Amongst the many greetings received were those from the following:—

MR. D. LION CACHET, past-president of the South African branch of the Institute of British Foundrymen.

J. COLLIS & SONS, LIMITED, London.

MR. QUENTIN LUMSDEN, British Iron and Steel Federation.

MR. CHARLES MONSEUR, Liège, Belgium.

PHILIPS LAMPS, LIMITED, London.

DR. MONT. FRANTISEK PISEK, Brno, Czechoslovakia.

MR. N. VINCOTTE, Fonderie Montefoire, Saint Denis, France.

MR. D. H. WOOD, President of the Institute of British Foundrymen.

FOWLER-MARSHALL MERGER

At the annual general meeting of Marshall, Sons & Company, Limited, Gainsborough, Mr. Ashley S. Ward disclosed that a merger between the Marshall Company and John Fowler & Company (Leeds), Limited, had been completed. The merger takes the simple form of an exchange of the £200,000 ordinary capital in John Fowler & Company (Leeds), Limited, for £200,000 ordinary capital in Marshall, Sons & Company, Limited. Mr. C. W. Hayward, chairman of John Fowler & Company, and Capt. E. N. Griffith, deputy chairman, will join the board of Marshalls' and certain Marshall directors will, in turn, join the board of John Fowler's. Mr. Ward said that by taking this step the company would be able materially to increase the output of the Field Marshall heavy wheel Diesel tractor, which is now firmly established and in great demand. The merger is of vital importance as the two companies are almost alone in the Empire in catering for the heavy Diesel tractor range; it provides the rationalisation of both products and production, and the resultant increase in total turnover will satisfy the needs of the home and overseas market for Diesel heavy wheel tractors and track-laying tractors.

Pooled Resources

These two old-established firms, both nearly 100 years old, will pool their manufacturing, design and selling organisations, thereby increasing efficiency and production for the home and export trade and placing themselves in the position of covering the Diesel tractor field. In addition, the combination will continue to produce Diesel engines and locomotives, threshing machinery, tea-preparing machinery, road rollers and wire-drawing machinery. The Sprotborough mechanised foundry, situated approximately half-way between Leeds and Gainsborough, acquired by John Fowler's from the Ministry of Supply, will be utilised by the group. With factories at Leeds, Gainsborough, Biggar, Crook and Sprotborough, covering 50 acres and, ultimately, employing 7,500 workpeople, this will constitute one of the largest engineering groups in Europe.

BOOK REVIEW

Factory Management, by P. H. Billington. Published by Emmott & Company, Limited, 31, King Street West, Manchester, 3. Price 3s. 6d.

There was a practice in pre-war days of dating the author's preface. Now there is only the date of publication. This question is raised because it is obvious to the reviewer that this book was written during the war. Hence it is now ready for revision. References to the Essential Work Orders; the Home Office regulations; the Workmen's Compensation Act.; A.R.P.; the 46-hr. week for offices, and 52 for the factories, are all out of date. The general layout of the book is excellent, and the author is obviously a man possessing much practical experience, but the reviewer is convinced that a thorough revision in the light of post-war experiences would make the book much more generally acceptable. V. C. F.

AUSTRALIAN OVERSEAS TRADE

Australia's overseas trade position for the first quarter of the current financial year is striking evidence of the dramatic change in international trade conditions since the end of the war. Exports totalled nearly £A81 million, compared with £38 million in the same three months of 1945-46. Imports were slightly lower at £A50 million, compared with £55 million, and the balance of trade showed an export surplus of over £A30 million, compared with an import surplus of £17 million in the same three months of the previous financial year.

These export figures are ample evidence of Australia's trading strength at the present time. The latest instance is afforded by the buoyant wool markets since the resumption of auctions and the breaking of previous record prices at successive sales. Britain is still by far Australia's best customer, taking nearly 25 per cent. of total exports in the period under review. Britain's share in the purchase of Australia's exports has dropped since before the war, the comparable 1938 figure being 45 per cent. but the total value has increased considerably to £22 million, compared with £14 million.

A feature of current trade figures, however, is the increase in exports to British Eastern countries, the total for the three months of 1946-47 having risen to £13½ million, compared with £1 million for the first three months of 1938-39. Although much of this trade has been in cereals, there has been a proportion of manufactured and processed goods. For some time it has been claimed that Australia is the logical supply centre for Eastern countries. These arguments have been backed up by the number of trade missions and trade representatives, official and private, who have visited Australia, particularly from India, during the last few years.

HOUSE ORGANS

One Hundred and Eleven, published by the Hammond Lane Foundry Company, Limited, of Dublin. The Christmas issue contains an obituary notice of Mr. David Frame, the founder of this progressive concern. Few have done more to industrialise the Irish Free State than Mr. Frame. The magazine announces that the new chairman and managing director is his son, Mr. David D. Frame. For the rest, this issue is, as usual, devoted to the internal happenings within the organisation, together with a few short stories.

The Stantonian, Vol. 6, *No.* 2. This issue announces the shedding of all the colliery interests of the Stanton Ironworks Company, Limited, and the appointment of the colliery's general manager as Area General Manager under the National Coal Board. A start is made with the history of Stanton—1846 to 1946—but this instalment is only a preface and later issues should relate much, not merely of local, but of general, interest. The balance of this issue is devoted to internal happenings.

SCOTTISH LIGHT CASTINGS INDUSTRY

PROSPECTS FOR 1947

(By Our Scottish Correspondent)

Production in the light castings industry in Scotland, after little more than a year of peace, has now risen to, and in some cases passed, pre-war output figures, despite limiting factors such as man-power shortages and outworn plant. If the industry can overcome these obstacles to all-out effort, a bright future is promised. This general picture has been gained from a tour by our Scottish correspondent to foundries around Falkirk.

Most recent official statement in Britain indicates that in August last, although the number of workers engaged on production for the home market had increased, engineering industries were actually 8 per cent. below pre-war man-power levels.

Shortage of Moulders

In its application locally the problem of man-power means that the foundries are short of something like 400 moulders, and since the ancillary trades cannot find employment unless there are moulders, the result is a very big decrease in productive power. What has caused this shortage of moulders? The war undoubtedly upset the normal flow of recruitment into the trade, but there are other factors.

In the course of inquiry, our correspondent ascertained from several sources that recruits are not coming into the trade in satisfactory numbers. Many means have been tried to attract them, but without marked success. In the Midlands, where there are more moulders per population than anywhere else in Britain, one firm decided to advertise in the local Press, and the advertisement was framed thus: "Youths wanted for foundry nursery. National Light Castings rates and conditions, plus a free dinner." Despite the food shortage and the acknowledged appetites of youths of 14, not one applied!

To combat apathy, employers in the Falkirk district recently approached the County Education Committee with the suggestion that Burnbank Foundry should be purchased as a foundry school for the training of youths. It is hoped that this move will have results which will justify the expenditure of £7,000 on the scheme. Another suggestion is that the whole system of apprenticeship should be overhauled and put on a similar basis to that prevailing in the general engineering trades.

Italian Labour

In their efforts to break the labour bottleneck, the Government intimated a few weeks ago their intention of introducing Italians to the foundries. Concensus of opinion locally among employers and employees is that very few of these Italians will be of any use in the light castings industry, but may help to ease the position in the heavy foundries. One employer said that he had not heard of any local foundry making application for Italians, and he did not think any would come to Falkirk.

The secretary of Falkirk Trades Council gave it as his opinion that the lack of skilled labour in the moulding shops was largely due to the industry not having kept step with progress. In some cases, he said, the methods of a century ago remained the methods of to-day, except that the creative instincts of the worker had been sacrificed to mass production.

Employees' Welfare

Despite this, our correspondent found evidence enough to prove that conditions in the foundries have greatly improved in recent years, and managements are now increasingly concerned with the welfare of their employees. Introduction of improved canteens, shower baths, dust-abatement plants, and other improvements are pointers in this direction. For lack of the fine old type of moulder who was an artist as well as an artisan, there has been a forced development of mechanised moulding in recent years. Machine moulding is not in itself a recent innovation; at Burnbank Foundry, German-made moulding machines were being used as long ago as 1910. Yet, in a sense, mechanisation has only recently won its way over the craftsman moulder. Progress in this respect is particularly evident at the Grange Iron Works, Camelon, of the Grangemouth Iron Company, Limited, and at the foundry of its associate company, Camelon Iron Company, Limited. These developments have followed many years of systematic experiment.

In pursuance of this policy of mechanical moulding, the Grange and Camelon foundries have converted a plant which, during the war, made tank track links, into modern machinery for making rain and soil pipe connections in quantities unheard of before. This is the only mass-production plant for this type of goods in Scotland, but others must follow rapidly. At Grange also there is a continuous furnace system for the liquid enamelling process, of which there is only one other in Scotland.

Production in these two foundries has gone up considerably since before the war, and their products are now being largely used to supply temporary houses throughout the country, in nearly half of which their goods can be seen.

Increased Bath Production

At Carron Company's foundry, also, there are two complete mechanised plants working on the production of housing castings, the company's main product at the moment, and these are helping to a great extent to relieve the labour position. Carron are hoping in the course of a month or two to increase their bath production by mechanised methods. In addition, the company have attempted to circumvent the man-power shortage by introducing apprenticeship, or "green" labour. This has been moderately successful, and production in many spheres has reached pre-war figures, and in some cases has even passed it.

Grahamston Iron Company, Limited, are also installing the latest types of mechanised machinery to overcome the obstacle of man-power shortage. First instalment for the manufacture of rain-water pipes,

Scottish Light Castings Industry

etc., has now been completed in an entirely new and modern building. Other machines, cranes, etc., have also been installed in the moulding shop, and satisfactory results are being obtained. The company's output is now almost entirely confined to housing requirements of every description, and they are specialising in vitreous, porcelain and glass enamelling for the treatment of their products. Enamelling layout is up to date in every way, and hundreds of clients have expressed their satisfaction with the finish. A careful study has been made in the foundry of the problem of improving conditions for the workers, and in this connection the latest dust-extraction machinery has been installed in the dressing shop. Plans for a new canteen, baths, etc., are also being put into effect. These attractive innovations, the company hopes, will do something to attract youths to the trade.

M. Cockburn & Company, Limited's foundry at Gowanbank, the first foundry in the district to lay on baths for the workers, is less concerned with the manpower problems. "The chief difficulty in the way of still further increase of production," says Mr. Hunter, director and general manager, "is not shortage of labour, but capacity of plant, and additional equipment, ordered many months ago, is eagerly awaited. Shortage of raw materials has so far not been serious, but the future is, of course, uncertain, particularly as regards power."

Generally speaking, the position at the Falkirk Iron Company, Limited's foundry is approximately the same as at others in the district. Shortage of man-power is the biggest obstacle to meeting the rush of present orders. The point was also made at this and other of the foundries that, owing to urgent home demands, only a small export quota had so far been allowed to ironfounders. It was hoped that this would be increased to enable foundries to retain their pre-war customers, who are clamouring for goods.

Although reconstruction of the foundries, especially in Scotland, on more mechanised lines, was advocated as giving greater output, lower costs and better conditions for the worker, it was pointed out that mechanisation should not be used as a yardstick of efficiency. Although there was room for more mechanisation and the extended use of mechanical aids in ironfoundries, few all-embracing principles could be propounded. This much is certain. Whatever may be the future structure of the Scottish ironfounding industry, of which Falkirk is the centre, the small service foundry, working with skilled labour rather than machines, must remain an essential feature of it.

WELSH INDUSTRIES FAIR

REVIEW OF METALLURGICAL EXHIBITS

This year, the Welsh Industries Fair, which was held at the Royal Horticultural Halls, London, from January 1 to 7, revived all the best features of pre-war efforts. Unlike the "Britain Can Make It" Exhibition, anonymity was replaced by a desire, on the part of manufacturers, if not exactly to sell, to interest visitors in their goods. For instance, a really interesting discussion took place at the stand of Richard Thomas & Baldwins, Limited, of the future competition for cast-iron rainwater goods from aluminium alloy pressings. Real confidence was expressed not only as to the technical superiority of the goods manufactured, but their ability to compete in price. Where the natural surface finish is not deemed suitable then it is supplied with a priming coat to promote maximum paint adhesion. The pipes shown stood well away from the wall to allow of easy painting all round.

Ingot Casting Machine

There were exhibits by the Tubal Cain Foundry of castings and machinery. They will probably get a large quantity of enquiries! Then there was a joint exhibit by Sheppard & Sons, Limited, of New Foundry, Bridgend, and the Sklenar Patent Melting Furnaces, Limited, of East Moors Road, Cardiff. Here, a 1-ton oil-fired type furnace, stated to be capable of melting 7 cwt. of aluminium in 12 minutes, or a ton of gunmetal in an hour, was erected so as to feed a Sheppard ingot casting machine. This, for exhibition purposes, was running at seven to eight feet a minute. It consists of a continuous conveyor on which are mounted a number of ingot moulds, which, as they rise to a convenient height for discharging into a container, are in their later stages subjected to a cooling blast to aid rapid solidification. The moulds, made from hematite, are designed so as to spill from one to the following one in case they are over-filled. On one side the design showed carried a flat lip so that where good appearance is necessary the moulds can be skimmed off neatly at a suitable working height. Originally, a four-speed motor was supplied, but experience has shown that it is preferable to furnish sets of gears, amongst which the user can select the most suitable and return the others. The machine shown was using a 3-h.p. motor for driving, and one of 2 h.p. for cooling. Naturally, such a machine cannot be standardised, as too many variables operate, such as speed of output, type of alloy handled, and so forth. The machine had every appearance of being solidly made and particularly well guarded.

Belt Conveyor

Another exhibit which attracted our attention was by Fisher & Ludlow, Limited, 110, Strand, London, W.C.2, who had a belt conveyor in operation. Discreet enquiries showed that they were supplying the foundry industry through the equipment firms. The one being used at the exhibition was a little on the light side for core shop use. Their catalogue shows a nice ploughing-off system for cross-feeding on to a second conveyor.

As the exhibition remained open for only a week, we suggest that it might with advantage tour the major provincial centres.

A NOVEL MECHANICAL POURING UNIT*

By J. R. SHEPARD and W. J. OLSON.

The pouring of 370 brake shoe moulds per hour has been achieved by the American Brake Shoe Company through its installation of centralised mechanical pouring. Controlled by remote push button control, this equipment is operated at a rate of 11 tons per hour by one operator in comfort. Formerly, five to six pourers were used.

This system, for which patent application has been made, was designed at the company's construction and maintenance department, and was assembled in the company's own shops. Its advantages, which were particularly patent during the man-power shortage in converting several difficult jobs into one of safety and comfort, have been proved so worth while that this plan is being extended to all plants where layout permits its use.

In the Brake Shoe's roll conveyor type mechanised foundries, brake shoe moulds, made in cast-iron flasks with a ¼-in. steel plate used for a bottom board, are placed on a fabricated steel pallet. Each pallet holds nine moulds and is built from two Z bars welded together with struts. As each pallet is filled, it is pushed down roll conveyor lines where pouring was formerly done with hand buggy ladles. The moulds were weighted at fixed stations by means of air-operated weight lifters which raised and lowered nine pouring weights. After pouring, the moulds were pushed to the end of the roll conveyor line and transferred to gravity lines for return to the shakeout.

Because of the uniformity in size of the moulds, centralised mechanical pouring was for some time deemed feasible. Early attempts to use a large ladle with nine spouts met with failure since it was impossible to keep an equal flow of iron from each lip. Also when one mould refused to take metal, it meant spilling a great deal of iron or pouring the other eight moulds short. It was realised that it would be necessary to have separate ladles that could be actuated individually, and, after many months of trial and development, the electrically controlled hydraulic system was evolved.

The basis of the system consists of six ladles each holding 500 lb. of metal, each ladle being supported by an individual lift cable and also fixed supports for pivoting each ladle. The ladles are supported over a pit with a sand bed to catch spill iron and are tilted by means of hydraulic cylinders through a cable, and a trunnion fixture. A schematic view of the pouring unit is given in Fig. 1.

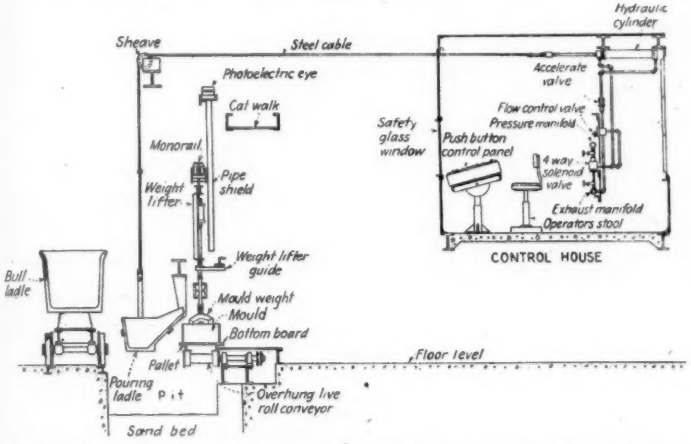

FIG. 1—ELEVATION DRAWING SHOWING ESSENTIAL ELEMENTS OF THE MULTIPLE POURING DEVICE WHICH TO DATE HAS BEEN INSTALLED IN SIX BRAKE SHOE PLANTS.

The pallets of the moulds are conveyed to the pouring station by means of powdered roll conveyors. The first conveyor, called the feed conveyor, is used to bring the pallets to the ladles. It is constructed of multiple rollers, and each roller is composed of two chilled wheels fixed to a shaft. The conveyor is powered with a 3-h.p. motor with a Uni-Brake to prevent coasting and for accurate spotting. Power is transmitted to each shaft by means of a series of progressive chains and sprockets. The power conveyor in front of the ladles, called the pouring conveyor, is similar to the feed conveyor except that outboard bearings are used to keep them away from the heat of the spill iron in the pit. The live rollers are positioned midway between the ladle spouts to prevent spillage of iron.

The moulds are weighted by means of a travelling air-operated weight lifter. Twelve weights, hung on a monorail carriage, are lowered and raised vertically by air cylinders. After the moulds are poured the weights resting on the moulds travel with the pallets over the pouring conveyor away from the pouring station. The weights are then raised and returned by means of a long air cylinder, to a definite location for lowering on the next set of unpoured moulds. Six ladles are used, spaced at every other mould, thus necessitating one short movement and one long movement of the conveyor to pour 12 moulds.

*Slightly abridged from an article appearing in a recent issue of "The Iron Age."

COLOUR IN THE FOUNDRY

DEVELOPMENTS AT SALFORD

Now that the heaviest work in the colour-painting of the interiors of the David Brown & Sons (Huddersfield), Limited, machine shops is nearing completion, the Works Engineering Department is turning its attention to the decoration of the two foundries within the group, and New Year's Day saw the contractors start on the iron and steel foundry of P. R. Jackson & Company, Limited, Hampson Street, Salford. Because of the obvious difficulties in the use of paint on exposed surfaces when the foundry is in operation, the work will take 12 months to complete, but in the light of experience of painting the engineering shops of other works in the David Brown group these difficulties have been robbed of much of the earlier impracticality and now represent little more than nuisance value.

Psychological Factors

Whilst, however, the earlier experiences of the David Brown organisation will be of the utmost value in the method of application, the experiment in their other works is not yet sufficiently established to form any reliable opinion as to the precise value of the selected colour schemes in the relief of tedium, the elimination of the accident factor which is said to arise from personal heedlessness, and the overall brightness set up by light-reflective surfaces which is designed to create an unobtrusive cheerfulness and thereby predispose to a greater production; and the colour scheme selected will be that originally proposed by the firm's consultant industrial psychologists.

At present, the quality most apparent at Park Works, Huddersfield, is that of vastly improved "seeing" conditions (as distinct from visibility) and the attendant benefits arising from a new conception of orderliness and tidiness.

There had been a minor temptation to work into the colour scheme an incidental plan for the distinctive painting of mobile plant such as moulding boxes, barrows, etc., to identify ownership with a particular department on the surmise that they would not be illicitly borrowed by another section and would therefore enjoy prolonged serviceability, but wiser counseis prevailed, it having been the experience that where distinguishing marks had been applied loose plant was still borrowed and that the proprietary marking was suspiciously akin to delegation of responsibility of charge.*

Details of Colour Scheme

Broadly, the colour scheme depends on light stone arrested by contrast with implement blue, the impression of freedom being enhanced by white ceilings. Doors, windows, hoppers, clothes lockers and small overhead tackle are to be finished in deep Devon red and the large overhead cranes in light stone, their working parts touched with orange. All these paints are high gloss. Aluminium will be used for mould drying and storage racks, storage hoppers, etc., and flat battleship grey for welding booth interiors. Service pipes will be picked out in pale blue, nut brown, black, forest green, signal red, yellow, royal blue and aluminium, according to purpose. Details of the colour scheme are as follow:—

Ceilings—*white.*

Trusses, girders, gutters, side windows—*light stone.*

Dado to walls, stanchions, columns (at 5 ft.)—*implement blue.*

Walls—*light stone.*

Large travelling cranes and runways—*light stone* (crane ends, hand rail and block—*orange;* 6 in. *orange band* across full length of crane).

Telpher cranes—*implement blue.*

Telpher crane hoppers—*deep Devon red.*

Small overhead runways and conveyors—*aluminium,* with crane or moving parts in *Devon red.*

Jib cranes—*Devon red.*

Doors, surrounds, steel staircases, ladders, platforms, clothes lockers—*Devon red.*

Storage hoppers and mould drying and storage racks—*aluminium.*

Welding booth interiors—*flat battleship grey;* exteriors—*light stone.*

Office and sub-station interiors: ceilings—*white;* walls—*light stone;* dado—*implement blue;* doors—*Devon red.*

Office and subs-tation exteriors: walls—*light stone:* dado—*Devon red.*

Furnaces, canopies, drying stoves, shotblast chambers and trunking and dust extraction plant—*heat-resisting aluminium.*

Sand driers, mixers and drilling machines—*oil resisting implement blue.*

General offices: ceilings—*ivory;* walls—*warm cream;* skirtings—*deep Devon red;* dado—*deep reseda green;* doors and surrounds—*reseda green;* heating pipes and radiators—*copper-bronze composition.*

* We are not quite convinced of the logic of this statement.—EDITOR.

NATIONAL FOUNDRY COLLEGE

Establishment of a National College at Wolverhampton and Staffordshire Technical College for the foundry industry is foreshadowed in a governor's report to be presented to the Wolverhampton Education Committee.

Proposals for carrying this into effect have been submitted by the Ministry of Education. The college is to be governed by an independent board of governors, appointed by the Minister, but including representatives of governors of the Technical College, Wolverhampton and Staffordshire local education authorities.

The principal of the technical college is to be a director of the national college, which is also to have a full-time head appointed by the Minister.

Approved net expenditure by the board of governors in establishing and maintaining the national activities of the college, including approved expenditure on the establishment and maintenance of a hostel for students will be eligible for direct grant from the Ministry at the rate of 100 per cent.

It is proposed to ask the Minister to receive a deputation to discuss its establishment.

NEW YEAR HONOURS

AWARDS TO SCIENTISTS AND INDUSTRIALISTS

The New Year Honours List, published last week, includes details of awards to many people associated with the iron and steel, and allied industries. Brief notes on some of the honours are given below.

Barons

SIR WALTER THOMAS LAYTON, Director-General of Programmes, Ministry of Supply, 1940-42, and head of the Joint War Production Staff, Ministry of Production, 1942-43.

SIR ERNEST DARWIN SIMON, governing director of Henry Simon (Engineering Works), Limited. He was area officer for the North-Western Region, Ministry of Aircraft Production, during the war.

Knights Bachelor

MR. HAROLD MONTAGUE BARTON, Financial Director, National Dock Labour Corporation, Limited. He is deputy chairman of Wales, Limited, bedstead manufacturers, of Birmingham.

BRIG.-GEN. ATWELL CHARLES BAYLAY, chairman, Birmingham and District Engineering and Allied Employers' Association.

DR. WILLIAM HENRY COATES, a deputy chairman, Imperial Chemical Industries, Limited. He was secretary of Nobel Industries, Limited, 1925-26, and is a member of the British National Executive Committee of the International Chamber of Commerce.

MR. CHARLES PERCY LISTER, chairman and managing director of R. A. Lister & Company, Limited, general engineers and ironfounders, of Dursley, Glos. He is also chairman of Blackstone & Company, Limited, manufacturers of Diesel engines, etc., of Stamford, and managing director of the United Kingdom Commercial Corporation, Limited.

MR. THOMAS MCPHERSON, director and general manager, Wallsend Slipway & Engineering Company, Limited.

MR. WILLIAM GUY ROPNER, lately Director of the Convoy Section, Ministry of War Transport. He is a director of Sir R. Ropner & Company, Limited, and is also on the boards of the Consett Iron Company, Limited, and the Consett Spanish Ore Company, Limited.

Order of St. Michael and St. George
K.C.M.G.

SIR JOHN BALLINGALL FORBES WATSON, Director of the British Employers' Federation. He has been a member of the governing body of the International Labour Office since 1928 and was president of the International Organisation of Industrial Employers, 1932-33. He has been a member of several Government committees.

C.M.G.

MR. ARTHUR DITCHFIELD STORKE, director of the American Metal Company, Limited, and British Copper Refiners, Limited.

Order of the British Empire
G.B.E.

SIR FREDERICK JOSEPH WEST, who receives the award for services to the Ministry of Labour and National Service, is chairman and managing director of West's Gas Improvement Company, Limited, chairman of the Manchester Ship Canal Company, and a director of the Iron Trades Employers' Insurance Association, Limited. Sir Frederick is also a past-president of the Manchester Association of Engineers and the Manchester Engineering Council, and has twice been president of the Manchester Engineering Employers' Association.

C.B.E.

MAJOR FRANK ELLIOT SHIRLEY BEAVAN, director and general manager, Mounstuart Dry Docks Company, Limited.

MR. FREDERICK STEPHEN BUTTON, lately a member of the Industrial Court.

MR. JAMES LOUIS PHILIP KENT, superintendent, ship division, National Physical Laboratory, Department of Scientific and Industrial Research.

MR. STANLEY FEARGUS STEWARD, Director-General of Machine Tools, Ministry of Supply.

O.B.E.

DR. GEORGE EDWARD BAIRSTO, Senior Principal Scientific Officer, Ministry of Supply.

MR. JOHN CARSON, manager, Liverpool Repair Works, Harland & Wolff, Limited.

MR. JAMES WHITE GIBB, director of Alkali Division, Imperial Chemical Industries, Limited.

MR. RICHARD ALAN HACKING, lately controller of production, Dorman, Long & Company, Limited.

MR. ARTHUR HILLIER, chairman and managing director, Sperry Gyroscope Company, Limited, Brentford.

DR. LEONARD BESSEMER PFEIL, manager, research and development department, Mond Nickel Company, Limited.

DR. DAVID DOIG PRATT, Assistant Director, Department of Scientific and Industrial Research.

M.B.E.

MR. WILLIAM ORR DOWLING, assistant manager, Engine Works, Harland & Wolff, Limited, Belfast.

MR. ALEXANDER ROBERTSON EDMISTON, manager, Palmers Dry Dock, Prince of Wales Dry Dock Company (Swansea), Limited.

MR. JAMES JONES, secretary and director, John Nicholson & Sons, Limited, Leeds.

MR. DOUGLAS HYNDMAN LANG, shipyard manager, William Denny & Bros., Limited, Dumbarton.

MR. ALBERT EDWARD LEEK, general manager and director, Distington Engineering Company, Limited.

MR. THOMAS JOSEPH MATTHEWS, works manager, Metal and Produce Recovery Depot, Eaglescliffe, Co. Durham.

MR. PATRICK MOCKLER, lately superintendent, Imperial Smelting Corporation, Limited, Avonmouth.

MR. SEWARD NOEL MORGAN, assistant manager, John I. Thornycroft & Company, Limited, engineers, shipbuilders, iron and brass founders, etc., of Westminster, London, S.W.1.

MR. WILLIAM JOHNSTONE STEWART, engineering manager, Marine Department, Caledon Shipbuilding & Engineering Company, Limited, Dundee.

PERSONAL

MR. B. G. HARRISON has resigned from the board of Crabtree Electrical Industries, Limited.

MR. C. S. GILL has been re-elected chairman and MR. F. A. MARTIN elected vice-chairman of the British Steel Founders' Association.

MR. O. INMAN, chief engineer at the Stocksbridge Works of Samuel Fox & Company, Limited, has been appointed a director of the company.

MR. KENNETH HALL has been appointed managing director and MR. S. E. CLOTWORTHY a director of the Northern Aluminium Company, Limited.

MR. HAROLD H. BERRESFORD, managing director of the Staveley Coal & Iron Company, Limited, has returned from a business tour in the United States.

MR. A. M. RITCHIE has resigned from the board of Bairds & Scottish Steel, Limited, following his appointment as an area general manager under the National Coal Board.

MR. WILLIAM LITTLEJOHN PHILIP has retired from the board of Spencer (Melksham), Limited. Mr. P. ERIC MILLBOURN has been appointed chairman of the company in his place.

MR. HENRY HUTCHINSON has retired at the age of 65, after nearly 51 years at the Atlas Foundry of Walmsleys (Bury), Limited. He became foreman of the planing and shaping department in 1915.

MR. P. C. SHARP, MR. J. H. R. NIXON, MR. B. L. METCALF, MR. D. S. A. E. JESSOP and COL. H. T. THORNLEY have been appointed local directors of the Brush Electrical Engineering Company, Limited.

MR. H. B. HOCKEN, manager of the Birmingham branch of the London Electric Wire Company & Smiths, Limited, has retired after nearly 45 years' service with the company. He is succeeded by MR. E. W. DARVILLE.

MR. F. A. FOX is relinquishing his position as chief metallurgist of Magnesium Elektron, Limited, and is joining the staff of the British Welding Research Association this month. He will be assistant director of research.

MR. JAMES CAMPBELL, MR. WM. D. K. MARSHALL, MR. ERNEST D. RUSSELL and MR. FRANCIS R. TOPPING have been appointed directors of William Denny & Bros., Limited, shipbuilders and engineers, of Dumbarton.

MR. GEORGE WILSON, SEN., managing director of the Carmuirs Iron Company, Limited, Camelon, Falkirk, who has retired after having been with the company since its inception 47 years ago, has received a presentation from the employees.

MR. L. SATCHWELL, who has resigned his managing directorship of the Rheostatic Company, Limited, will continue as chairman and advisory technical director of the company. MR. T. N. FLIGHT and MR. M. J. GARTSIDE have been appointed joint managing directors.

MR. THOMAS W. PEARS has been appointed to represent the British shipbuilding industry in the South American continent. The appointment follows the visit of the British Shipbuilding Mission to several of the South American countries last year. Mr. Pears recently arrived in Argentina and he will establish his headquarters in Buenos Aires.

MR. WILLIAM LOGAN has been presented with gifts from directors and employees of the Anderson-Grice Company, Limited, Taymouth Engineering Works, Carnoustie, on his retirement. He has been in ill-health for the past year. Mr. Logan had been associated with the company since 1915, having been works manager for 25 years and latterly a director.

MR. T. F. MILLS has relinquished his appointment as general manager, and has been appointed deputy chairman of Burnell & Company, Limited, steel-sheet rollers and galvanisers, of Ellesmere Port, Wirral, Ches. MR. CLIFFORD MILLS and MR. J. MICHAEL PARKES have been appointed joint general managers, while MR. J. D. FRASER has been appointed a director.

MR. H. MCNEIL has been appointed general manager of Babcock & Wilcox, Limited. MR. W. F. C. SCHAAP, who has been appointed deputy chief engineer, will retain his present position of chief project engineer. Other appointments are those of MR. C. H. DAVY as chief research and development engineer, and MR. T. W. POLLOCK as chief technical engineer, Renfrew Works, on the retirement of MR. E. G. WEEKS.

MR. E. K. SCOTT has been appointed a special director of Dorman, Long & Company, Limited. Mr. Scott, who is 42, returned recently from a 10 weeks' visit to China as a member of a British Government goodwill trade mission. He went to Manchuria in 1929 and represented the company in China from 1932 to 1938. Shortly before the war he undertook a mission to Turkey for the company. He served in the R.E.M.E. during the war.

MR. J. C. W. HUMFREY has joined the firm of Riley, Harbord & Law, consulting metallurgists and chemists, of Parliament Mansions, Abbey Orchard Street, Victoria Street, London, S.W.1, as from January 1. He was for 21 years metallurgist to Messrs. Sandberg, consulting and inspecting engineers. During the war Mr. Humfrey advised the Ministry of Supply on metallurgical problems, and held the position, first as deputy, and later as Superintendent of the Technical Application of Metals (S.T.A.M.), from which position he has just retired.

DR. R. J. SARJANT, head of the research department of Hadfields, Limited, and a local director of the company, has been appointed to the Chair of Fuel Technology at Sheffield University. He was a member of the special committee which reported to the Department of Scientific and Industrial Research on the supply of fuel technologists. He also serves on committees of the British Iron and Steel Research Association, the British Refractories Research Association, and the Ministry of Fuel and Power. Hadfields, Limited, have agreed to Dr. Sarjant's early release, and it is hoped that he will take up his duties early in the coming term.

MR. E. T. JUDGE, chief engineer of Dorman, Long & Company, Limited, has been appointed a director of the company. He was appointed a special director in 1944. Mr. Judge, who is 38, joined the company as a trainee in 1930 after leaving Cambridge, where he obtained a Mechanical Sciences Tripos with honours. Following experience in the central engineering department, he became chief technical engineer to the company in 1937. He is familiar with iron and steel plants in this country, in pre-war Europe and in the United States, where before and during the war he studied the latest developments. Responsible for the company's central engineering and plant development departments, Mr. Judge will have the task of carrying through the design and construction of the £8,000,000 project for a new steelworks and universal beam mill on the Lackenby site.

Wills

CARLISLE, C. G., of Sheffield, metallurgist and steel manufacturer	£7,399
BERSEY, F. T., founder of the Laystall Engineering Company, Limited, Southwark, London, S.E.1, and chairman of Joshua Bigwood & Son, Limited, engineers and ironfounders, etc., of Wolverhampton	£88,454

STEEL CONTROL ORDER AMENDMENTS

WIRE ROPE PRICES INCREASED

The Control of Iron and Steel (No. 55) Order, which came into force on January 1, amends the maximum prices of certain steel products, the principal alterations being increases in the prices of wire ropes, brake cable, tinned steel wire, and high-carbon cold-rolled strip. The Order also reduces the quantity of conduit tubes that may be acquired without licence, and releases shell-steel discards from price control.

Following are details of the changes resulting from the new Order:—

Blooms to Admiralty specification.—Normalising extras on small sizes increased.

Alloy steel billets and bars and tinplate and sheet bars.—Related schedules re-edited and minor corrections made.

Cold-rolled strip.—Revised extras and allowances on high-carbon quality.

Mild-steel wire and wire products and stitching wire. —Tinned wire prices increased by from £1 to £6 per ton. Brake cable.—5 per cent. increase. Special patented wire and patented roping wire.—Tinned wire prices increased by from £1 to £6 per ton. Locked coil ropes.—5 per cent. increase. Wire ropes.—5 per cent. increase.

Railway tyres and axles.—Small quantity extras clarified.

Merchants' consolidated price schedule.—Minor amendment.

Military bridge sections.—Withdrawn.

NON-FERROUS SCRAP METAL PRICES

REVISED LIST OF QUOTATIONS

The following prices of non-ferrous scrap metals have been announced by the Ministry of Supply. The prices are for scrap metal at Ministry of Supply depots at which the Minister is prepared to effect a sale to a buyer subject to having sufficient material of that particular quality available at a convenient depot at any particular time. The list refers to delivery within the current and next three calendar months, but is published without prejudice or commitment. Without notice the schedule of materials may be amended in the light of changing circumstances and prices may be altered in accordance with market conditions, production costs and other factors. The publication of the prices does not constitute an offer of sale. The following prices are per ton, ex works:—

COPPER—Clean, untinned, cut up, £109 10s.; bright. untinned copper wire, £110 10s.; No. 1 copper wire, £110; No. 2 copper wire, £107; shell-band scrap (other than turnings), £109 10s.; copper turnings (including shell-band turnings), £98.

ZINC—Zinc scrap, £58 10s.

BRASS—S.A.A. webbing, £92 10s.; defective cups and cases, £91 10s.; cut-offs and trimmings, £85 10s.; muffled and/or mechanically treated cases, £88 10s.; turnings, loose, £79; fired Q.F. cases, £93 10s.; Q.F. webbing, £93 10s.; Q.F. cut-offs and trimmings, £91 10s.; Q.F. defective cups and cases, £93 10s.; Q.F. turnings, £80; other 70/30 process and manufacturing scrap, £90; 70/30 metallics, £73 10s.; 60/40 rod swarf, £72 10s.; process and manufacturing scrap containing over 62 per cent. and up to 68 per cent. copper, £89; broken down fuse scrap, 60/40, £82; 90/10 gilding metal webbing, £103; 90/10 gilding metal defective cups and envelopes before filling, £100 10s.; cap metal webbing, 95/5, £104.

Scrap gilding metal bullet envelopes (max. antimonial lead content 4 per cent.), £89; scrap, cupronickel bullet envelopes (max. antimonial lead content 0.08 per cent.), £104 10s.

PRICE OF TUNGSTEN ORE

The Ministry of Supply have increased the issue price of tungsten ore of standard grade from 70s. to 75s. per unit of WO_3, delivered consumers' works, as from January 1. For special high-grade scheelite to the following specification:—WO_3 minimum 68 per cent., tin maximum 0.60 per cent., arsenic maximum 0.10 per cent., molybdenum maximum 0.10 per cent., the price is 80s. per unit WO_3, delivered to consumers' works.

THE "CAPITAL GOODS" industries involved in a partial census of production for 1946, which will be the forerunner of the annual production census as outlined in the Government's White Paper issued in December, include mechanical engineering, electrical engineering, hardware, hollow-ware, metallic furniture and sheet metal, tool and implement, and building.

OBITUARY

MR. JOHN DAVIDSON, formerly of J. & H. McLaren, Limited, Midland Engine Works, Leeds, died on December 27.

MR. WILLIAM LIDDELL, a director of J. Hawthorn & Cox, Limited, Canal Foundry, Newtown, near New Mills, has died at the age of 65.

MR. DAVID BARNET CHRISTIE, who for 30 years has been managing director of Galvanizers, Limited, Scotstoun, Glasgow, has died at the age of 77.

MR. ALFRED HOWGATE, of Clegg & Howgate, Limited, ironfounders, of Bingley, Yorks, whose works was formerly at Keighley, has died at the age of 78.

MR. FRANK C. GARDNER, who succeeded his father as chairman of William Gardner & Sons (Gloucester), Limited, flour milling engineers, died recently. He was 45.

MR. ALEXANDER C. WILSON, who was found dead on Christmas Eve, was formerly in business as a brassfounder at Guard Vennel, Perth. He was 78 years of age.

MR. JOSEPH REDGWICK, of Joseph Redgwick & Sons, Limited, woollen machinery manufacturers, of Ossett, Yorks, died recently as the result of an accident. He was 42 years of age.

MR. SCOTT M. GIBSON, for over 30 years engineer surveyor for the Scottish Boiler & General Insurance Company, Limited, has died at the age of 61. He had been an active member of the Regional Fuel Efficiency Committee of the Ministry of Fuel and Power.

LT.-COL. HARRY RHODES, senior partner in C. E. Rhodes & Sons, civil and mining engineers, of Rotherham, died recently. He was 70 years of age. For 10 years, until 1929, he was chairman of the Midland Iron Company, Limited. He was president of the Midland Institute of Mining Engineers from 1921 to 1923.

MR. F. J. J. GIBBONS, governing director of James Gibbons, Limited, builders' and cabinet brass and malleable-iron founders, etc., of Wolverhampton, died recently. Eighty-four years of age, Mr. Gibbons joined the company 70 years ago. His name is associated with some 250 patents. He was one of the pioneers in Wolverhampton of the bicycle trade, his company making many of the old-time machines.

MR. W. S. EDWARDS, managing director of W. G. Bagnall, Limited, Castle Engine Works, Stafford, and of Cowlishaw, Walker & Company, Limited, engineers, ironfounders, etc., of Biddulph, Stoke-on-Trent, has died at the age of 64. He was a vice-president of the Institution of Locomotive Engineers and a member of the Institution of Mechanical Engineers. Mr. Edwards had been president of the North Staffordshire Engineering Employment Association, and was a vice-president of the Birmingham, Wolverhampton and Stafford District Engineering and Allied Employers' Association. He was also a member of the Midland Regional Committee of the Engineering and Allied Employers' National Federation.

MR. THOMAS HOSKINSON, manager of the blast furnaces of Round Oak Steel Works, Limited, Brierley Hill, Staffs, died recently. During his 26 years at Round Oak he took a very active part in both the commercial and technical sides of the industry and was a well-known figure on the Birmingham Iron Exchange. Mr. Hoskinson had been a member of the Iron and Steel Institute for many years, while he also belonged to the South Staffordshire Iron and Steel Institute of which he was president in 1930 and hon. treasurer from 1938 up to the time of his death. He was a very active and useful member of the Joint Iron Council under the presidency of Mr. Harold Berresford. Mr. Hoskinson was born at Ipswich in 1882. Before joining Round Oak Steel Works he was assistant manager of the West Yorkshire Iron & Coal Company's furnaces and later assistant blast-furnace manager to the Park Gate Iron & Steel Company, Limited. In 1914 he became blast-furnace manager to Lloyd's Ironstone Company at Corby, holding that position until 1920.

FOAMED SLAG PRODUCERS' FEDERATION

As a result of the increasing use of foamed slag aggregate for building purposes, the producers have formed the Foamed Slag Producers' Federation, which will act as the technical consultant on behalf of its members, and will be available to give advice to users of foamed slag on its various methods of application. It will also conduct research into all branches of construction in which foamed slag can be used to advantage.

The founder members of the Federation are:—Appleby-Frodingham Steel Company, Limited, Clugston Staveley, Limited, Slag Aggregates, Limited, Foamslag (Tees-side Production), Limited, and Foamslag (Scottish Production), Limited. These companies will retain their identity as producers, and will sell through their own organisations.

Mr. M. Gallai-Hatchard has been appointed general manager of the Federation, whose offices are at 85-88, Grosvenor Gardens House, Grosvenor Gardens, London, S.W.1 (telephone: Victoria 1485).

INCREASING INTEREST is being taken by production engineers in the possibilities of powder metallurgy, and abstracts on this subject are contained in the November issue of the "Nickel Bulletin," which has just reached us. Useful information is also given on the question of nickel plating, zinc-base die castings, and other subjects dealt with include extensive notes on heat- and corrosion-resistant alloys, glass-to-metal seals, etc. The "Bulletin" is obtainable free of charge from the Mond Nickel Company, Limited, Grosvenor House, Park Lane, London, W.1.

NEWS IN BRIEF

THE MINISTRY OF SUPPLY will now sell silicon metal of 97 per cent. purity at £97 per ton delivered, irrespective of quantity.

A ZINC REFINERY capable of producing 100 tons of special high-grade zinc a day and 70,000 tons of sulphuric acid a year is to be built at Arvida, Quebec.

THE WESTERN WORKS, an eight-mill plant, owned by the Llanelly Associated Tinplate Companies, Limited, is under repair and, as soon as sufficient millmen are available, production will start after a lapse of five years.

DURING 1946, as far as can be ascertained, North-East Coast shipyards launched 140 vessels of 541,561 gross tons. Outputs would have been greater still if launches had not been postponed through supply difficulties.

GLENFIELD & KENNEDY, LIMITED, hydraulic engineers and founders, of Kilmarnock, have been granted a petition for warrant to erect a new engineering shop, stores and assembly block, at an estimated cost of £120,000.

VICTOR PRODUCTS, LIMITED, Wallsend, manufacturers of mining machinery, etc., have carried out their promise to turn over the profits from an order valued at £60,000 for mining plant for U.N.R.R.A. to their employees.

A NEW gross price-list has just been issued by Wellington Tube Works, Limited, Tipton. It covers tubes and fittings, and is complete with all revised extras and allowances. Wellington Tubes will supply copies on application.

PROPOSALS TO INCREASE the ordinary capital of the Bentley Engineering Company, Limited, by £32,500 to £80,000 and to place the shares privately through M. Samuel & Company, have been sanctioned by the Capital Issues Committee.

DURING THE PAST YEAR the employees of the Mirrlees Watson Company, Limited (engineering and foundry departments), subscribed towards infirmaries, convalescent homes, the Aid to China Fund, and other institutions, a sum amounting to over £701.

HOPES REPOSED in the Government have led to disillusionment, states a letter which has been issued by the shop stewards of Barr & Stroud, Limited, scientific instrument manufacturers, of Anniesland, Glasgow, in protest against lack of work in the factory.

WITH A VIEW to simplifying office procedure, the United Wire Works, Limited, Edinburgh, have decided to dispense with the names under which two of their departments have traded in the past—the Patent Process Wire Weaving Company and Granton Wire Mills.

ORDERS FROM HOLLAND for eight dockside cranes for Rotterdam and 20 for Amsterdam have been placed with the Clyde Crane & Engineering Company, Limited, the total value being £400,000. The company has also secured a £190,000 order for a new coaling plant for Istanbul.

THE MONTHLY INFORMATION SHEET for November, 1946, of the British Standards Institution lists among draft standards circulated for comment CH 7513, white-heart malleable-iron castings (revision of B.S. 309) and CH 7514, blackheart malleable-iron castings (revision of B.S. 310).

BRITISH POLAR ENGINES, LIMITED, have acquired a foundry on the north side of the Clyde to ensure a more regular and increased supply of castings for the company. Extensions are to be made to the fuel pump shop and the patternshop, while a new copper shop and power station are to be established.

A COURSE OF TRAINING on full wages to introduce juveniles to working life, and to stimulate their interest in the industry they have entered, has been planned by Tube Investments, Limited, and will be introduced in their larger factories. First courses have already been held in the works at Oldbury, Birmingham.

TWENTY-FIVE GOLD WATCHES were recently presented to employees of Accles & Pollock, Limited, Oldbury, Birmingham, a subsidiary of Tube Investments, Limited, who had completed 25 years' service with the company. This yearly custom was begun in 1924, when Accles & Pollock had reached their 25th year, and since then no fewer than 550 watches have been presented.

THE RESUMPTION of steelmaking activities at the wartime shadow factory at Linwood, near Paisley, at a cost of £3,000,000, has been authorised by the Government. Six furnaces at the factory are to be reopened, and it is reported that plans have been prepared which will ensure that by next month the plant will be operating at full capacity and producing 3,500 tons of metal weekly.

THE MINISTRY OF SUPPLY announce that their Malayan Tin-ore Buying Agency has ceased to purchase tin concentrates in Malaya and that their tin agent in Lower Burma (Mr. A. P. Ruddy) has ceased to buy tin concentrates there. Producers are now free to sell concentrates to the smelters. The Ministry will, however, continue to buy all the tin metal produced by the smelters in Malaya.

TWO ASSOCIATED Stockton-on-Tees companies, the Power-Gas Corporation, Limited, and Ashmore, Benson, Pease & Company, Limited, are to build an ammonium-sulphate manufacturing plant and a producer-gas plant for the firing of what is believed to be the largest battery of coke ovens in Western Europe. The total value of the two contracts, which are for the Dutch Government, exceeds £500,000.

RICHARD CRITTALL & COMPANY, LIMITED, heating and ventilating engineers, etc., of Brentford, Middlesex, who are in the process of internal reorganisation with the objects of assisting the general development of the organisation and to expand certain sections of the industry, have formed five subsidiary companies to achieve these objects. These are Channel Conduits, Heather Filters, Richard Crittall (Industrial Plant & Equipment), Richard Crittall Properties, and Richard Crittall Research & Development. The capital of each company is £1,000 in £1 shares.

IMPORTS AND EXPORTS OF IRON AND STEEL

BOARD OF TRADE RETURNS FOR NOVEMBER

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in November and in the first 11 months of 1946. Figures for eleven-twelfths of 1938 are given for purposes of comparison.

Exports of Iron and Steel by Products.

Product.	November, 1946.	Eleven months ended November.	Eleven-twelfths of 1938.
	Tons.	Tons.	Tons.
Pig-iron	7,595	23,914	86,113
Ferro-alloys, etc.—			
Ferro-tungsten	30	260	473
Spiegeleisen and ferro-manganese	6,924	54,225	4,763
All other descriptions*	77	953	960
Ingots, blooms, billets and slabs	465	4,196	8,932
Iron bars and rods	494	9,090	2,931
Sheet and tinplate bars	—	203	11,349
Wire rods and bright steel bars	3,635	49,587	8,954
Other steel bars and rods	13,334	226,380	93,503
Special steel	1,583	16,144	4,521
Angles, shapes and sections	6,322	124,012	61,787
Castings and forgings	525	2,973	1,483
Girders, beams, joists and pillars	2,032	58,298	30,682
Hoop and strip	3,388	66,314	34,262
Plates, ¼ in. thick and over	17,082	270,969	120,048
Black plates	1,035	21,262	13,227
Black sheets	2,219	41,481	58,218
Galvanised sheets	2,310	31,106	134,690
Tinplates	9,218	102,768	292,702
Tinned sheets	368	2,485	1,293
Terneplates	184	1,825	3,965
Decorated tinplates	52	530	4,004
Cast-iron pipes, up to 6-in. dia.	4,125	42,080	44,850
Do., over 6-in. dia.	4,215	31,598	39,383
Wrought-iron tubes	22,638	249,604	201,641
Steel rails	2,254	144,463	97,166
Sleepers and fishplates	1,142	88,507	23,268
Other railway material	3,237	23,976	24,541
Wire	3,708	68,956	50,584
Wire manufactures	4,323	35,221	27,032
Nails, tacks, etc.	837	7,946	3,490
Rivets and washers	547	8,072	7,824
Wood screws	214	4,797	2,302
Bolts, nuts, and metal screws	2,495	22,714	16,109
Stoves, grates, etc.	672	5,770	8,388
Sanitary cisterns	92	969	2,577
Fencing material	672	4,147	4,703
Anchors, etc.	671	5,668	5,808
Chains	879	8,634	5,767
Springs	341	5,060	3,603
Hollow-ware	5,353	70,832	9,812
All other manufactures	14,011	150,245	198,421
Total	151,298	2,088,234	1,756,219

* The figures for 1946 are not completely comparable with those for earlier years.

STEIN & ATKINSON, LIMITED, have received a contract from Christiana Spigerverk, of Oslo, for the design, supply and erection at Oslo of a "Rust" continuous pusher-type billet reheating furnace. The furnace is of the two-zone, tonnage and soaking, type incorporating the American arch suspended roof, and is completely automatic in the control of furnace temperature and combustion. The total air is preheated in a Newton needle recuperator. The furnace is oil-fired and has an output of 16 tons of billets per hr.

Total Imports of Iron and Steel.

From	November, 1946.	Eleven months ended November.	Eleven-twelfths of 1938.
	Tons.	Tons.	Tons.
British India	7	14,593	142,664
Australia	15,052	105,259	33
Canada	4,089	96,813	107,594
Other British Countries	104	2,592	5,132
Sweden	688	3,917	82,313
Norway	3,107	13,772	30,960
Belgium	1,428	12,002	250,874
Luxemburg	333	732	53,718
France	120	448	235,901
U.S.A.	19,816	220,920	183,967
Other Foreign Countries	173	3,248	139,100
Total	44,917	474,296	1,232,247
Iron ore and concentrates—			
Manganiferous	—	113,150	57,093
Other sorts	570,648	5,979,772	4,676,714
Iron and steel, scrap and waste, fit only for the recovery of metal	43,467	430,284	579,519

Total Exports of Iron and Steel.

Destination.	November, 1946.	Eleven months ended November.	Eleven-twelfths of 1938.
	Tons.	Tons.	Tons.
Eire	4,498	58,256	51,076
Channel Islands	424	4,833	6,798
Palestine	4,487	85,891	7,398
British West Africa	4,508	40,583	45,598
Union of South Africa	8,796	205,631	211,830
Northern Rhodesia	128	2,720	18,860
Southern Rhodesia	1,726	40,782	33,195
British East Africa	900	26,289	23,771
British India	5,977	72,186	145,454
Burma	2,903	14,206	16,970
British Malaya	4,743	36,431	61,036
Ceylon	1,097	12,767	23,862
Hong Kong	1,365	16,362	21,629
Australia	1,939	30,825	156,662
New Zealand	2,926	40,660	120,893
Canada	1,017	9,346	78,292
British West India Islands	3,643	27,412	40,563
Anglo-Egyptian Sudan	447	14,382	7,599
Other British Countries	1,001	27,156	20,095
Soviet Union	715	1,241	3,987
Finland	4,840	47,513	16,140
Norway	4,664	65,486	18,584
Iceland	327	11,037	603
Denmark	8,406	188,251	79,984
Poland	137	13,385	2,280
Netherlands	9,275	141,594	47,262
Dutch East Indies	1,006	8,357	25,031
Dutch West India Islands	1,249	10,108	2,258
Belgium	1,945	28,799	18,631
France	3,189	62,584	12,271
Portugal	2,106	40,481	7,070
Portuguese East Africa	1,117	5,187	13,035
Spain	643	8,631	7,117
Italy	326	7,333	4,711
Greece	1,495	20,376	1,606
Turkey	5	10,791	12,611
Egypt	1,695	81,532	31,542
Iraq	3,167	53,688	23,595
Iran	11,037	82,040	101,181
China	3,265	23,092	20,287
U.S.A.	644	1,529	2,005
Venezuela	5,661	35,132	4,285
Ecuador	304	4,286	1,460
Chile	789	6,017	5,769
Brazil	2,939	41,643	15,574
Uruguay	433	11,530	6,955
Argentine	6,961	77,344	72,743
Other Foreign Countries	20,463	232,559	106,071
Total	151,298	2,088,234	1,756,219

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SPECIFICATION

WEIGHT	80-90 lbs.
Length	22 inches
Width	8½ inches
Thickness	3¾ inches

(at notch 2½ inches).

Made in our well-known

STANTON, HOLWELL & RIXONS BRANDS

THE STANTON IRONWORKS COMPANY LIMITED NEAR NOTTINGHAM

NEW COMPANIES

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

Evans, Thompson & Company, Hathern Road, Shepshed, Loughborough, Leics—Engineers, etc. £1,600. R. B. Thompson, A. and T. Lovell, and L. Evans

G. N. Perry & Company, Radnor Chambers, Cheriton Place, Folkestone—Heating and ventilating engineers, etc. £2,500. G. W. H. Perry and C. B. Cawthorne.

S. J. Frith & Son, 7, Great Eastern Road, Stratford, London, E.15—Heating, ventilation and air-conditioning engineers, etc. £3,000. R. S. Frith and S. R. Davies.

Walker Bros. (Willenhall), Enterprise Works, Orchard Road, Willenhall—Production, efficiency and consulting engineers, etc. £1,000. R. Arblaster and F. Walker.

John Young (Sunderland), Southwick Goods Station, Southwick, Sunderland—Shipbreakers and scrap-metal merchants. £10,000. J. and R. M. Young and C. H. Murrell.

C.G.L. Consulting & Experimental Engineers, The Folly. Wheathampstead, Herts—£2,000. E. R. Curwen, G. H. and H. J. Lewis, W. J. Cutts and P. J. Gosnold.

B. C. & R. A. Long, 20, Southsea Road, Kingston, Surrey—Motor and general engineers, etc. £1,000. B. C. and R. A. Long, F. A. R. Bessant and P. W. Notman.

Broders Bros. Metals (Holding) Company, 20, Queen Caroline Street, Hammersmith, London, W.6—Metal smelters, refiners, etc. £20,000. T. J. and D. L. McManis.

DIRECTORATE OF COLVILLES, LIMITED

In accordance with the special resolution passed at the annual meeting of Colvilles, Limited, iron and steel manufacturers, of Glasgow, held in May of last year, the company intimate that Mr. W. Barr, chief metallurgist, Mr. R. C. Dymock, chief labour officer, Mr. T. W. Hand, chief mechanical engineer, Mr. J. M'Cracken, senior works manager, Mr. R. Marshall, sales manager, Mr. L. Rothera, chief electrical engineer, and Mr. T. J. Smith, purchasing manager, have been appointed executive directors of the company. The articles of association of the company were amended at the meeting so as to delete the article relating to the power of each director to appoint an alternate director, and to substitute in place of the deleted clause an article conferring powers on the directors to appoint an executive board. The functions of this board, it was stated, would be the management of the works and the sale of their products.

CONTRACTS OPEN

Any date given is the latest on which tenders will be accepted. The address is that from which forms of tender may be obtained.

Berwick-upon-Tweed, January 17—Cast-iron work, for the Borough Council. The Borough Surveyor, Municipal Buildings, Wallace Green, Berwick-upon-Tweed.

Birkenhead, January 17—Iron castings, miscellaneous wrought iron, steel fabric reinforcements, etc., for the Rural District Council. The Borough Engineer and Surveyor, Town Hall, Birkenhead.

Hartismere, January 27—Supply and laying of approx. four miles of 4-in. and eight miles of 3-in. dia. cast-iron water mains, for the Rural District Council. W. Herbert Bateman & Partners, consulting engineers, Halifax House, Bank Plain, Norwich. (Fee £3 3s., returnable.)

London, S.W., January 29—Sewer castings, iron, steel, etc., for the Lambeth Borough Council. Mr. G. H. Buckett, borough engineer, Town Hall, Brixton Hill, London, S.W.2.

Nairn, January 17—Extension and improvement of sewage system, for the Town Council. G. Gordon & Company, 6, Queensgate, Inverness.

Pontypool—About 2,000 yds. of sewers, with connections, settlement tank, etc., for the Rural District Council. Thomas & Morgan & Partners, 23, Gelliwastad Road, Pontypridd. (Fee £1 1s., returnable.)

Stanley, January 17—Construction of about 10,000 yds. of 24, 18, 15, 12, 9 and 6 in. spun-iron, earthenware and concrete iron sewers, also sewage disposal works, for the Urban District Council. (Fee £10, returnable.)

Wimborne Minster, January 20—Construction of approx. 800 yds. of 6-in. dia. spun-iron sewers, ejector station and disposal works, etc., for the Urban District Council. W. Herbert Bateman & Partners, consulting engineers, Batheaston, Bath. (Fee £3 3s., returnable.)

NON-FERROUS SCRAP METALS

STOCKS AND SALES

The Ministry of Supply has issued the following information regarding the Government's stocks and sales of non-ferrous scrap metals. The stock of scrap on charge on November 30 was 153,334 tons, made up as follows:—Q.F. cases and muffled S.A.A., 59,604 tons; ingots, 17,508: lead and lead alloy, 1,269; copper and copper alloy, 20,316; zinc and zinc alloy, 14,107; other grades (including mixed metal from cancelled contracts, Admiralty scrap, Army scrap, and M.O.W. scrap), 40,530 tons.

Sales during October and November amounted to 22,487 tons (the approximate value being £1,200,000), and the analysis was as follows:—Q.F. and muffled S.A.A., 11,382 tons; copper and copper alloy, 6,888; lead and lead alloy, 3,955; other grades (including zinc and zinc alloy), 262 tons. Material put out to tender during October and November totalled 12,570 tons, of which 6,925 tons were lead. During this period 21,597 tons were invoiced, the value being £1,096,250.

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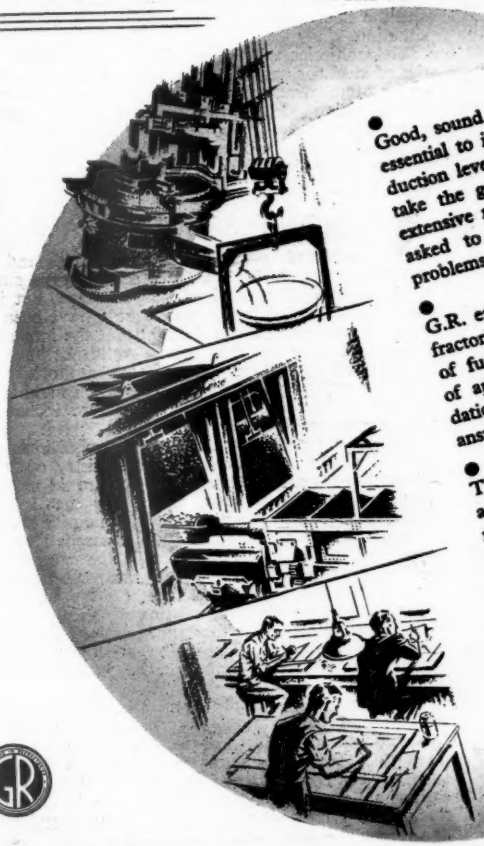

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192

Raw Material Markets

IRON AND STEEL

There will be no lack of business for the foundries for a long time to come. The year starts with exceptionally heavy order-books and with strong pressure for supplies. There is a particularly keen demand for all forms of light castings for the building and other industries, and it is hoped that shortly the light foundries will be able to obtain maximum outputs. This, however, will be possible only when sufficient labour becomes available. There is likely to be some difficulty in securing extra quantities of pig-iron in the high-phosphorus category, because supplies now are only just about meeting current needs and, owing to the shortage of skilled labour and coke, there is not much prospect of additional furnaces being put on to the production of foundry pig-iron. The demand for basic pig-iron for steelmaking also is strong, so that furnaces cannot be transferred to the production of foundry numbers. Imports would appear to be almost out of the question.

There is very little export of pig-iron from this country, although there are numerous markets open. During the last six months supplies of refined iron have been released for shipment, but even this has now slowed down, and makers are already fully booked for the next few months.

Considerable quantities of low- and medium-phosphorus iron and hematite are wanted to meet the expanding needs of the general engineering, speciality and jobbing foundries, which have become very active and have a considerable amount of work ahead of them. Cast-iron scrap is in big request, the demand being accentuated by the stringency in pig-iron. Other needs of the foundries are being met fairly satisfactorily, except that the shortage of wagons and railway embargoes are hampering the free flow of supplies. In some areas the difficulty has become acute. It is understood that there are good stocks of coke at the ovens, but the wagon shortage has prevented the fuel from being loaded. There is no difficulty in acquiring limestone, ganister, etc.

The semis requirements of the re-rollers are heavy. Sheet rollers are receiving good supplies of sheet bars, which is fortunate, as their bookings in sheets of all grades are exceptionally heavy and long waiting periods for the execution of new business are inevitable; but the rollers of small bars, light sections, casement bars, strip, etc., are still handicapped by the shortage of billets and blooms, and there is unlikely to be any appreciable improvement in the situation in the months to come, because it has been impossible for the Control to obtain bulk supplies from abroad.

Considerable tonnages of semi-finished steel are, of course, being manufactured in this country, but the total is short of essential requirements. All the re-rollers are heavily booked for this and the next period. The best use is being made of any defective billets, crops and the like which are forthcoming, but the quantities are not large and there are no stocks on which to fall back. Some use has been made during the last month or so of electrically melted billets, which have been put to the execution of export orders, but after the end of Period I it is understood that this steel cannot be used for that purpose, as it will be urgently wanted for essential requirements in this country.

There continues to be a very heavy and far-reaching call in almost every direction for steel plates, joists and sections, and because of the heavy bookings, going well into Period II, it is difficult for new business to be placed with a promise of anything like reasonable delivery. Not only are the shipyards requiring large quantities, but most structural engineers are also busy, and the steelworks find it very difficult to cope with the situation.

The collieries will be requiring considerable quantities of steel for new development and maintenance, and under State ownership it is unlikely that there will be any lessening of the requirements, which have been heavy for a year or so. Most of this steel takes the form of arches, roofing bars, and props, and most makers are already full up for Period I.

NON-FERROUS METALS

The increased prices of copper, lead and zinc, announced last week, created something of a surprise. A higher quotation for lead was expected, but it was not anticipated that the increase would have been more than £10 per ton. It was thought that the introduction of higher copper and zinc prices would not have come before next month, as hitherto the authorities have acted generally on a quarterly basis when making price changes and both copper and zinc were increased in price in November.

Revised licensing procedure for the acquisition of tin metal has been announced by the Ministry of Supply. Applications for future licences to acquire tin metal will only be granted if accompanied by the following declaration:—(1) We certify that the quantity requested on the accompanying application is needed to cover orders for our products, and that in the case of applications for virgin metal full allowance has been made for our expected intake of scrap. (2) We certify that, in respect of tin metal, our existing stocks plus our outstanding purchases, plus the tonnage now being applied for, will not exceed four months' consumption at our average monthly rate of consumption in September and October, 1946.

The Ministry of Supply has made some changes in the contract procedure against licences for lead. In future, contracts against licences for unwrought lead of guaranteed 99.97 per cent. lead content will only be issued by the Directorate of Non-ferrous Metals if applications are accompanied by the following signed declaration:—We certify that, in respect of unwrought lead as sold by the Directorate, our existing stocks plus our outstanding purchases, plus the tonnage for which a contract is now being applied for, will not exceed four months' consumption at our average monthly rate of consumption in September and October, 1946.

The existing procedure of issuing licences to implement the system of quarterly allocations of lead is unchanged.